

WHAT IS CLAIMED IS:

1. A polyurethane polishing pad for chemical-mechanical polishing which can polish a silicon dioxide wafer at a rate of at least 600 Å/min with a carrier downforce pressure of about 0.028 MPa, a slurry flow rate of about 100 ml/min, a platen rotation speed of about 60 rpm, and a carrier rotation speed of about 55 rpm to about 60 rpm, wherein the polishing pad does not contain abrasive particles and comprises no externally produced surface texture.
2. The polishing pad of claim 1, wherein the polishing pad has a void volume of about 25% or less.
3. The polishing pad of claim 2, wherein the polishing pad has a void volume of about 5% or less.
4. The polishing pad of claim 1, wherein the polishing pad comprises pores having an average pore size of about 50 µm or less.
5. The polishing pad of claim 4, wherein the polishing pad comprises pores having an average pore size of about 40 µm or less.
6. The polishing pad of claim 1, wherein the polyurethane has a Flexural Modulus of about 350 MPa to about 1000 MPa.
7. The polishing pad of claim 1, wherein the polyurethane has a Rheology Processing Index of about 2 to about 10 at a shear rate of about 150 l/s and a temperature of about 205 °C.
8. The polishing pad of claim 1, wherein the polyurethane has a glass transition temperature of about 20 °C to about 110 °C and a melt transition temperature of about 120 °C to about 250 °C.
9. The polishing pad of claim 1, wherein the polishing pad has an average % compressibility of about 7 or less, an average % rebound of about 35 or greater, and a Shore D hardness of about 40 to about 90.

10. The polishing pad of claim 1, wherein the polishing pad further comprises a polymer resin selected from the group consisting of thermoplastic elastomers, thermoplastic polyurethanes, polyolefins, polycarbonates, polyvinylalcohols, nylons, elastomeric rubbers, styrenic polymers, polyaromatics, fluoropolymers, polyimides, cross-linked polyurethanes, cross-linked polyolefins, polyethers, polyesters, polyacrylates, elastomeric polyethylenes, polytetrafluoroethylenes, polyethyleneteraphthalates, polyimides, polyaramides, polyarylenes, polystyrenes, polymethylmethacrylates, copolymers and block copolymers thereof, and mixtures and blends thereof.

11. The polishing pad of claim 1, wherein the polishing pad further comprises a water-absorbent polymer.

12. The polishing pad of claim 11, wherein the water-absorbent polymer is selected from the group consisting of cross-linked polyacrylamide, cross-linked polyacrylic acid, cross-linked polyvinyl alcohol, and combinations thereof.

13. The polishing pad of claim 1, wherein the polishing pad comprises closed cells.

14. The polishing pad of claim 1, wherein the polishing pad has a cell density of about 10^5 cells/cm³ or greater.

15. The polishing pad of claim 1, wherein the polishing pad has a bimodal pore size distribution.